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Workshop 2

Pre-College Education

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Abstract

Pre-college education efforts are many and varied, involving the teachers, students, parents, museums, and youth groups. However, it is necessary to reach out to school administration at all levels if teachers are to be innovative in their approaches. This introductory meeting clearly indicated that more interaction between the participants would be profitable.

It is clear that the science pipeline leading from kindergarten to college entry needs to be filled with students. What is not clear is how we can do it. The plethora of projects being pursued by the NASA Space Grant College Fellowship (NSGC) programs to accomplish that goal are heartening and exciting. However this large gamut of programs may also indicate how new we are in this game and how little anyone knows about creating a pre-college interest in science and engineering. In a way it resembles the situation of the common cold--there is no known cure yet, so there are many so-called remedies. Unfortunately, the time we had together was entirely too short to address the evaluation situation, so that we can in the future zero in on the most effective approaches.

This report is: (1) a summary of the many ways the different NSGC's are approaching pre-college education; and (2) a list of suggestions.

The methods for introducing, interesting teaching and/or upgrading teachers in K-12 include:

Workshops, courses, conferences, institutes for

- Training
- Retraining
- Curriculum development
- Counseling methods
- Laboratory experience

Summer employment in aerospace industries

Similar endeavors for college education majors

Preparation of resources for teacher use includes:

- * Curricula
- * Libraries
- * Resource center
- * Audiovisual aids
- * Computer Programs
- * Props

Programs for students are being put in place:

- * Introduction of space-related topics into ongoing science programs
- * Seminars and symposia
- * After school space club
- * Adopt a school (by an NSGC college)
- * Space test competition between schools
- * Field trips
- * Hands on projects
 - Space and tools
 - 800# for assistance
- * College laboratory research experience
- * After school industry/teacher taught program for advanced students
- * Speakers at assembly
- * Summer day school program
- * Essay contest
- * Summer space-related employment
- * Space Camps
- * Tours of aerospace and NASA facilities
- * Science fairs
- * Traveling "museums" and "classrooms"
- * 800# - "Talk to an Astronaut"
- * Special TV programs for use in 4, 5, 6 grades with related teacher's guide and student materials
- * College student presentations
- * College campus visits
- * Computer conferences

Programs to enlist assistance from other sources include evening workshops for parents, establishment of a Scout Space Badge, and museum programs.

The following recommendations/comments were made by the participants:

- * Recruitment to participatory programs is no problem if there are good, on-going presentations in place.
- * Involve as many kinds of students as possible, not just science/engineer/math oriented--i.e., industrial arts.
- * Students like lots of give-aways.
- * Emphasize communication skills.
- * Bring parents into equation.
- * NASA has massive teaching resources.
- * Let's not con ourselves--creating enthusiasm doesn't substitute for good, basic learning and thinking in the sciences and math.

- * Why is there a drop in interest in science after 3rd or 4th grade?
- * We need to take advantage of the latest communication technology.
- * We need to continue networking as programs develop.
- * We should be doing more hands on science, since science educators place heavy emphasis on the value of experiments and laboratory work.

Two speakers strongly emphasized that if teachers are to use innovative means for reaching NASA's objective, the administrators must be reached--principals, supervisors, curriculum coordinates, as well as state-level administrators. Teachers are very often stymied in their efforts by lack of interest or understanding at executive levels. The felt that if this roadblock were not addressed, our efforts would fail. We as a group should be planning activity in that direction.

The general consensus is that this was just introductory and that more time is needed at our next meeting for input from experts and discussion of the value of each category of approach.